AN ALGA, FORMING A PSEUDOMORPH OF A SILICIOUS SPONGE.

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(Plate XLVIII., Fig. 5.)

(From the Australian Museum Laboratory.)

The sponge in question is a new species of Dactylochalina, and I will give a short description of it here, before entering on the subject proper of this paper.

Dactylochalina australis. Nova species.

The outer appearance of the sponge is very similar to that of Dactylochalina reticulata, R. v. Lendenfeld, described in a previous paper in this number of the Proceedings.

The whole sponge in Dactylochalina australis, is formed of cylindrical elongate parts, 8-10 mm. in diameter, with a circular transverse section and numerous large oscula. These are circular, and have an average diameter of 3 mm. The surface of these digitate structures is not smooth and regular as in other species, but appears rather rough and irregular in consequence of the presence of irregular protuberances and numerous sharp curves. The oscula are slightly raised. The length of these digitate processes is 150-250 mm.

A number, 6-20, of such cylindrical digitates grow out from a common base. They never form anastomoses.

The skeleton consists of a network of fine horny fibres, in the axis of which spicules ac^2 are contained. These are larger than in most other species; they are pretty numerous, straight, and decidedly spindle-shaped, gradually pointed.

Dactylochalina australis has been found in Port Jackson (Ramsay, v. Lendenfeld), Port Phillip (v. Lendenfeld), and Western Australia (Baily). Among the numerous specimens of Dactylochalina australis nova species examined by me, there were three which, although similar in shape, could be distinguished from the others by their greater rigidity. These came from Western Australia. On microscopic investigation, it was found that these specimens (dry) were not sponges at all, but Algæ. The whole structure is mainly formed of continually ramifying cylindrical branches, which form occasional anastomoses, and terminate on the surface of the digitate sponge with rounded ends. This structure is of a very uniform nature throughout. The thickest stems and branches are found in the interior; they measure 0·15 mm. in diameter. The final ramifications have a thickness of 0·08 mm.

The meshes of the network formed by these threads, are about 0·5 mm. wide, and somewhat similar to the interstices between the horny fibres in species of Dendrilla, but totally different from the shape of the meshes in the Chalinid sponges.

The threads themselves are formed of the ordinary vegetable cells, which are remarkable for their extremely thick wall.

On burning portions of the specimens, and examining the ash, the *same spicules are found in great numbers*, which are present in Dactylochalina australis the sponge, whose shape this Alga so closely resembles.

In every detail the shape of the sponge is copied; the protuberances on the surface, and the oscula are there, but not a trace of the *horny* skeleton of the sponge can be detected.

In the specimens examined no spores were found, so that I am not able to identify the Alga. It seems to be one of the Florideæ. There can be no doubt—this is proved by the presence of the silici-

ous spicules—that these structures are Pseudomorphs of the Dactylochalina australis. I assume, that the Alga is a parasitic species growing in the sponge, and extending throughout the whole body of it. The sponge is thereby resorbed by the Alga. The soft parts and horny fibres disappear, whilst the silicious spicules are left, and appear, on close examination, adhering to the outer side of the stem and branches of the Alga. In this way this Alga forms a true Pseudomorph of the sponge.

I do not think it in any way comparable with other more simple Alga-parasites found in sponges, which cause the formation of the filaments in the Thicinidæ, and others.

EXPLANATION OF THE FIGURE.

(Plate XLVIII., Fig. 5.)

Section through a portion of the Pseudomorph magnified.